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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A high-speed signal processor which functions as a waveform acquisition system and a high-speed analog-to-digital converter, said processor comprising:

a filter system for dividing ~~an~~ a single input signal into a series of adjacent frequency bands;

a frequency down converter for down converting one or more of the adjacent frequency bands as they are output from said filter system;

a digitizer for digitizing each frequency band output from said filter system; and
a system for reconstructing the original input signal.

2. (Canceled)

3. (Original) The high-speed signal processor as recited in Claim 1, wherein said filter system comprises an M-band filter bank.

4. (Original) The high-speed signal processor as recited in Claim 3, wherein the M-band filters in said M-band filter bank enable perfect reconstruction, meaning that the sum of the cascaded responses of the M-band analysis filters followed by the synthesis filters produces an overall flat amplitude response and group delay.

5. (Original) The high-speed signal processor as recited in Claim 3, wherein the M-band filters in said M-band filter bank are implemented optically using fiber optics.

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6. (Original) The high-speed signal processor as recited in Claim 3, wherein the M-band filters in said M-band filter bank are implemented electronically.

7. (Original) The high-speed signal processor as recited in Claim 3, wherein the M-band filters in said M-band filter bank are implemented using software.

8. (Original) The high-speed signal processor as recited in Claim 3, wherein each channel output is equalized, to thereby shape the transfer function of the channel into that of an M-band filter.

9. (Original) The high-speed signal processor as recited in Claim 8, wherein the channel equalization is implemented with Weiner filter technology.

10. (Original) The high-speed signal processor as recited in Claim 1, wherein a calibration signal is continuously injected into said processor to serve as a reference for quantifying and removing hardware errors.

11. (Currently Amended) A method for processing signals, comprising :
dividing ~~an~~ a single input signal into a series of adjacent frequency bands;
down-converting each frequency band to allow each band to be sampled at a lower rate;
digitizing each frequency band; and
reconstructing the original input signal.

12. (New) The method as recited in Claim 11, wherein said dividing step is performed using filters having a perfect reconstruction property.

13. (New) The method as recited in Claim 11, and further comprising a step of injecting a calibration signal such that it passes through a common point with the single input signal, prior to the performance of the dividing step.

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14. (New) The method as recited in Claim 11, wherein none of the steps involve removing noise supplied in the single input signal.

15. (New) The high-speed signal processor as recited in Claim 10, wherein said calibration signal is injected in a manner such that it passes through the same point as said single input signal, in front of said filter system.

16. (New) The high-speed signal processor as recited in Claim 1, wherein the system does not function to remove noise supplied in the single input signal.

17. (New) A high-speed signal processor which functions as a waveform acquisition system and a high-speed analog-to-digital converter, said processor comprising:

a filter system for dividing an input signal into a series of adjacent frequency bands, comprising an M-band filter bank;

a digitizer for digitizing each frequency band output from said filter system; and

a system for reconstructing the original input signal;

wherein the M-band filters in said M-band filter bank enable perfect reconstruction, meaning that the sum of the cascaded responses of the M-band analysis filters followed by the synthesis filters produces an overall flat amplitude response and group delay.